IMPORTERS  WHOLESALE

FISH :: PUMPS :: TANKS :: ETC.

EXPORTERS  RETAIL

AT LAST—THE SILENT AERATOR

"Erkoso"

220-250 VOLTS
A.C. ONLY

The initial consignment of a long-felt need in England
A SILENT FIRST-CLASS PUMP

Outstanding Points:
1. Silent and trouble-free running.
2. The diaphragm being of solid rubber will not require replacement.
3. Low electric consumption.
4. Airflow adjustment by the turn of a knob.
5. No oiling or attention required.

"ERKOSO" SUPER
Will operate 20 Tanks 55/-

"ERKOSO" I
Will operate 8 Tanks 45/-
Postage 1/6 extra

Obtainable through your Dealer or direct from

FALCON AQUATIC PRODUCTS LTD.

ING WORKS, NEW HEY ROAD,
SALENDINE NOOK,
HUDDERSFIELD

WHOLESALE
Dealers, send on letter head for trade terms and monthly price list. Open usual business hours for visitors.

Manufacturers of Space Heating and Aquarium Equipment, Fish Foods, etc.
Agents for "Aquatrop" Aquarium Cement
STUART ERSKINE
Wholesale Aquarist
WEAMAN STREET, BIRMINGHAM, 4
Telephone: CENTRAL 5997

TROPICAL FISH — COLDWATER FISH — TORTOISE — SNAKES
REPTILES. ALL LEADING BRANDS OF FOOD AND EQUIP-
MENT IN STOCK. MIDLAND & NORTHERN DISTRIBUTOR—
CHALLENGER AIR PUMPS AND PLANTAQUEOUS

Foods
Brosiam : Hykro : Spratts : Satro : Meta : Vega

Aerators

Heaters and Thermostats
Evans : Little Wizard : Angel : Es-ES : Prockter

Accessories
Thermometers : Corner Filters : Sediment Removers and
All Plastics : Planting Tools : Scrapers

“Aquafern”
RED — GREEN — NATURAL

Send for our Trade Lists and a personal visit from our Representative
CITY AQUARIA
MEMBER OF THE A.T.A.
Telephone: CHANCERY 3605

RETAIL

WHOLESALE

Hours of Business: Mon.–Thurs. 9.0.−5.30. Fri. 9.0.−6.30. Sat. 9.0.−1.30.

A GOOD SELECTION OF TROPICAL FISH AND PLANTS

COMPREHENSIVE STOCK OF EQUIPMENT

SHADES.  24" x 12" x 12"

HALF SHADE  15/-

OVERALL  27/-

GOOD SUPPLIES OF DAPHNIA AND TUBIFEX

MICRO, GRINDAL AND WHITE WORM ALWAYS IN STOCK

SPECIAL OFFER—Personal Shoppers Only
Zebras 1/9 :: Rosy Barbs 1/9 :: Red Swords 1/6

● CITY WORKERS. We will be pleased to take your orders for fish, and store fish until you go home in the evening. Cans loaned.

TRADE ENQUIRIES FOR PLASTIC GOODS AND TROPICAL FISH

76, RED LION STREET, HIGH HOLBORN, W.C.I.

2 Mins. from Chancery Lane and Holborn Tubes. Buses: Nos. 7, 7a, 8, 17, 22b, 23, 25 & 25b
WE OFFER YOU AN UNRIVALLED POSTAL SERVICE BY RETURN

Send now for our latest price list, enclosing a 1d. stamped self-addressed envelope.
Editorial

Are fishes singularly unhealthy creatures? Does the long list of major and minor ailments that occur in fishes signify a predisposition of this class to be attacked by disease and parasitic organisms? No more so than any other animals is the answer, we believe, to both questions. Deaths apparently caused by disease are frequent causes of discouragement for beginners, however, and before the notion becomes current that keeping fishes is to fight a losing battle there is need for fresh thought on the subject of diseases in aquarists' stocks.

It has long been recognised that fungus infection of fishes occurs as soon as injury or debilitation renders them liable to attack; the fungus is always present in aquarium or pond, but well fed and healthy fishes are resistant to it. Fishes from rivers are often found to have parasites such as fish lice or gill worms upon them. Under natural conditions they probably remain so parasitised all their lives, the numbers of organisms remaining nearly constant and the fishes suffering only slight discomfort. Putting a possibly teleological interpretation on this it could be said that a parasite gains nothing by killing its host when it is so dependent on it for sustenance.

Evidence is beginning to collect that many other troubles in fish stocks are similarly always with the fishes or in their surroundings, and that the trigger setting off the train of recognisable symptoms is some artificial factor like overcrowding, polluted water, poor diet, and so on. In an aquarium, where these factors are specially likely to intrude, infections may increase from their steady state to abnormally rabid attacks to which the fishes succumb.

Fishes can live for a long time with incomplete feeding, and because deaths suddenly occur without marked symptoms the conclusion that some obscure disease has appeared is not necessarily the correct one, although improper diet is not the least of the factors encouraging latent diseases to blossom into killer proportions. Fishes do have good natural resistance, and if the aquarist does not overcrowd, varies the feeding and keeps the aquarium environment clean, the disease hazard becomes a minor fish-keeping worry.
Notes on Swordtail Varieties

by...

R. G. MEALAND

THE swordtail (Xiphophorus helleri) is one of the oldest established tropical fishes to be kept in home aquaria. It is very active and quite hardy and, though known to hold its own, is rarely a bully, though at times a male will boss it in the tank. It shares with the guppy and platy the distinction (and this is in some ways a disadvantage) that it can easily be bred. Instead of making use of this point many aquarists allow the colour varieties of swordtails and platys to interbreed promiscuously with usually disastrous results.

Swordtail Needs

The chief requirements of swordtails (and in fact all livebearers) are a roomy tank in a light position, frequent feedings (five or six times a day if possible) with a varied diet of any good dry foods (not forgetting Bemax) and any of the various live foods such as Daphnia, chopped earthworms, white worms, Tubifex, mosquito larvae, etc., when and as they can be obtained. Temperatures should not exceed 75 F. and a fluctuating range from 65 F. to 75 F. seems to suit them well. I personally think swordtails do better in hard than soft water, though like so many points in our hobby, it will probably remain one of those things about which each aquarist has his own views.

If the tank goes a bit green so much the better and the soft algae found on the front glass and some plants is much loved by all livebearers. These conditions from the purely artistic point of view, may not appeal to some, but the fishes concerned seem to prefer it that way. Given a well planted tank with plenty of floating plants there should be no loss of the newly-born youngsters. The female alone should be in the breeding tank with water level dropped to six or eight inches (the level can be raised as the babies mature). Give the female plenty of food, especially Daphnia. I personally leave the female with her young, partly to know later from which female the young have come, and to give the female a restful time. The first family will be the smallest in number, rising through the second and third to the case of a maximum of often as many as 200 in swordtails, and towards the 100 mark with guppies and platys. I always like to keep the whole of the first family for future breeding as I am still convinced that they are ultimately the biggest fishes from any given female.

Breeding Varieties

Watch carefully from about one month onwards for signs of sex change and save some virgin females for future breeding or crossing. The actual time varies with the conditions of temperature, feeding, etc., as also with the individual fishes. It is a good plan to keep one tank for any type of male and one for virgin females. Do not mate your livebearers until they are about three parts towards full grown and use only your best in size, colour etc. for breeding.

The green swordtail is the original wild strain and is still a very attractive fish with the green iridescent sheen on its sides and a bright red lateral line going the length of the body; flecks of red should also be apparent in the dorsal and caudal fins. The male should carry a dead straight or gradually tapering sword, which, as the F.B.A.S. standards tell us “should be as long as the body.”

July, 1951

w. S. Fisz

Male swordtail of the Wiesbaden type, a fish developed in the German town of that name

latter point is one of the chief failings in most swordtail males especially if they carry too much platy strain in them. The red swordtail is now a well fixed variety; originally, no doubt a male red platy supplied the colour, but this was said to be about 30 years ago. Some very intense reds are now seen and the brick red and almost red brown varieties should no longer be bred as they have now been superseded. A fault from which many red male swordtails seem to suffer is the lack of a definite black margin on the upper and lower edges of the sword.

The albino variety seems now to be a more virile strain than was the case some years ago. The young of this variety would seem to be very succulent and great care is needed to save them from their carnivorous mother; in this case I invariably remove mother as soon as the family has arrived.

The green Wiesbaden swordtail is a pre-war variety from the German town from which it derives its name. Its producer, Dr. Müller, is said to have taken five years to perfect this variety. I was given a male in 1938 by Mr. A. H. Boughton of the former Artistic Aquaria Co. This was an odd one which by some mistake arrived in this country; previously only virgin females had arrived. I still remember phoning Mr. Boughton one Sunday when the first family was delivered, all showing a slight black coloration on the underpart of the body. Like most hybrids this fish often grows to a large size but, unlike some, the Wiesbadens sport a full length sword.

The red Wiesbaden was a simple cross with a red male swordtail and a virgin green Wiesbaden. I have only lately had this strain again, after letting it drop some years ago.

There are many other colour varieties of swordtails which it is hoped may be discussed and perhaps illustrated later. Swordtails are well worth any trouble one may take to raise and keep them and it is hoped that these few remarks may lead many to discovering the joys of keeping and showing them.
Remedying Faults in the Veiltail

by N. E. Perkins

Occasionally specimens are seen that support the usual view that the veiltail goldfish is the aristocrat of aquarium fishes. But all too often the fish which looks so proud and graceful may in the course of one or two seasons become a dejected mass of collapsed fins.

A very large percentage of specimens degenerate in this way, discouraging anyone who is genuinely fond of fish. To see such a specimen vainly trying to perform normal fish actions such as feeding or dodging a net is a sad spectacle, and the time spent by the fish crouched in an aquarium corner is apt to make any breeder feel guilty.

The question arises—are we expecting too much from the veiltail? Personally, I do not think so. My view is that if more attention be paid to fin structure, with dietary assistance in the form of additional calcium, the grievous faults might be remedied in this variety. Some of the over-development that is seen is the result of producing fish with maximum finnage too young, and of faulty selection with this aim in view.

Fins continue to grow in these over-developed specimens, so that at three or four years of age the fin rays are not strong enough to support the fin’s length. Perhaps by breeding for slower fin development together with special feeding and selection for stronger ray development this great disadvantage may be overcome.

That is the theory on which I am now working, coupled with a treatment that bars all coddling of the fishes—such as providing them with warmth in winter. I do not expect them to stand the full rigours of winter (although I have left one specimen outside this year as an experiment) but I think that the fishes should stand mild freezes such as they would experience in an unheated greenhouse. I hope eventually to produce a hardy strain that will retain its proud carriage throughout life—a period that should be some ten to fifteen years.

(Continued on opposite page)
AQUARIST AT HOME:

Mr. D. Collingwood
(HALIFAX)

I WOULD describe Mr. D. Collingwood of Woodside, Halifax as a good example of the "Home Aquarist." By that expression I mean the fancier who makes his fishkeeping a real relaxation for his leisure moments and a hobby to be enjoyed in the comfort of his home. His tanks are all situated about the house, and his largest, which is 36 inches long, 18 inches deep and 15 inches wide, is beautifully fitted into a wood casing, bringing the tank up to eye level, with a cabinet underneath. The entire unit is finished in such a manner that it makes an attractive piece of furniture in the living room. This tank, in keeping with its setting, is set up as a show or ornamental tank; the plants are in fine condition and the general aquascaping presents a pleasing picture with its fish community.

Mr. Collingwood as a tropical enthusiast is particularly interested in the swordtail, which he breeds on selective lines and exhibits as a specialty. He keeps the red, green and golden varieties and it is obvious, as one examines his stock, that his efforts are producing results in the right direction.

His tanks are heated by immersion heaters, with the usual thermostat control, but in this matter of temperature he does not believe in maintaining a steady reading because he considers this practice unnatural. The procedure he adopts is as follows, 80° F. is the highest temperature reading, which is kept steady for one week; then over a period of the next week the temperature is gradually dropped to 75° F. This is retained for a week, then lifted gradually back to 80° F. through the following week. The complete four weeks cycle is repeated continuously throughout the year. All the fish were in good condition, extremely active and healthy.

Mr. Collingwood also considers that varying the water temperature is a good method with fishes intended for exhibition purposes as the fishes are less likely to suffer ill effects should variations of temperature occur when being exhibited. It is for the same reason that he never uses aeration with his show stock; if they get accustomed to this and aeration is not supplied at an exhibition adverse reactions are the result.

Artificial lighting is used over the tanks and Mr. Collingwood informed me that after many months of experimenting with various forms of lighting, power of bulbs, irradiation times and the like he finds that the best results obtained are with a 40-watt bulb burning for seven hours each day over 24 ins. by 12 ins. by 12 ins. tanks. Plants grow at a steady rate, with no signs of forcing, and are strong, clean and of good colour. The water remains clear and algae is kept down. Any alteration to this procedure results in some form of disturbance. Mr. Collingwood's tanks are all placed in positions well away from windows, so that natural light is down to a minimum.

Jas. Stott

Garden Live Food

At this time of year a ready supply of live foods awaits your preparations to collect it from the garden. An old shallow vessel of some sort—a basin or old kitchen sink, filled with water and a few rotting leaves will be used as a receptacle for eggs by mosquitoes and midges. The resulting larvae can be netted out for feeding to the fishes. Blood worms are likely to appear in the rotting leaves and these very useful foods can be picked out and washed in a net before feeding. Keep the container out of the sun—under trees is a handy place—and do not forget to add water to it in hot weather. Rain water butts and tanks are also capable of yielding live foods and should be examined during the summer for insect larvae. Wash these under a tap before using them as food.

Remedying Faults in the Veiltail

(Continued from opposite page)

Veiltails are notoriously difficult to breed true to type and no matter how perfect the parents may be the proportion of veiltails in a spawning is usually very low. Therefore, with all the difficulties to be encountered in trying to produce a shapely fish, the colour must and should be a secondary consideration. This does not mean that it is to be ignored completely, but merely that shape and finnage strength must be primary breeding aims. To use weak-finned or poorly shaped fishes because their colour is good is a major mistake.

Providing all other things are equal it is a good idea when deciding which youngsters are to be retained for breeding to select those with the deepest colours, and also to retain a selection of metallic (scaled) and matt (transparent) fish. Crossing these two types will yield 100 per cent nacreous (calico) offspring, with the additional advantage that if they are from highly coloured stock an increase in colour values and patterns occur.

These points must be borne in mind at an early stage, for growth of the three types (matt, metallic and nacreous) varies considerably, so that separation at the earliest age is an advantage. In my opinion the treatment of nacreous and matt specimens also differs with regard to lighting from that necessary for the early coloration of bronze metallics.

To return to the question of veiltail deportment: selection of fishes showing stronger fin rays will, over a period of time, probably materially alter the whole appearance of this variety as we now know it. The possible result, while losing some of the veiltail's ethereal qualities, should have an increasingly alert appearance and should be a fish enabled to retain a far greater measure of control over its movements.

July, 1951
Three Aquarium Gadgets in One

by H. K. SAYER

An aquarist is frequently needing tools or gadgets of various kinds when maintaining and setting up his aquarium. If he has a different tool for each job he finds himself with a collection that needs considerable space for storage. It is obviously better if each tool has a handle at least a little longer than the water is deep, to avoid disturbing the fish by a pair of hands working in the water, so, with the idea of avoiding a clutter of long handled tools, I made this gadget.

It is really a long handle with various easily detachable tool-heads. It will bury the roots of plants in the gravel, dig them up without damaging the roots, move quantities of gravel from one part of the tank to another, scrape algae from the glass and, with the aid of a piece of bent wire, prune unwanted leaves from plants. Now, don't think making this will be a job beyond your ability. It is all extremely simple and anyone who has, or who can borrow, a knife and a pair of pliers, with tin snips as well if they need the shovels, can make this for less than a shilling, and that is at present day prices!

The basis of the tool is a piece of brass channel originally designed to connect lengths of curtain rails; it can be bought for threepence at any store dealing in this rail. The piece, which is shaped as in figure A, has a screw in each end to hold the curtain rail tightly in position, but in my aquarium gadget one screw is used to hold the handle and the other secures one of the tool heads. The handle is a length of bamboo cane which has been split lengthways, and cut to fit the brass holder tightly. When the cane is cut, remove the centre pithy wood. The outer wood is very tough and pliable and its strength will not be affected by the removal of all the softer wood. The cane should fit about half way along the slot in the brass and the screw can then be tightened to hold the cane firmly in position.

Now to make the various heads. The ideal material for this is the soft galvanized wire sold for use in the garden: it should be just thin enough to go into the slot in the brass when doubled as shown in figure C. Incidentally the right sort of wire is used to bind egg and cheese cases and grocers throw it away.

Figure B shows how the wire is bent round a single edged razor blade to form a glass scraper. Note the angle of the blade to the handle as this assists in holding the blade rigid. Make the loop for fitting into the tool head slightly wide at the roots of the plant well down into the gravel under the flat side of the tool, then, with a series of very short up and down movements, gradually lift the tool from the gravel. The roots will stay buried. If the roots are long start burying near the plant and work out to the root tips.

Almost any sheet metal can be used for the shovels, but aluminium which is stocked by most garages, is very suitable. Though fairly thick it is easily bent and cut to shape, and does not rust or corrode. Cut the metal to the shape shown in figure D; bend the back and sides at right angles to the base and fold the sides tabs round the back. If aluminium or other thick metal is used there will be no need to solder or rivet the joints.

I have found that this gadget with the tools described does most of the jobs in an aquarium, but if you have any other favourite tool of your own, it can almost certainly be adapted to fit this holder.

Hoping to breed tropicaLs?

You will want to see the latest of The Aquarist series of booklets

EXOTIC EGG-LAYING FISHES

by Jack Hems

The beginner's introduction to methods of breeding popular tropical species

With colour plates and photographs

2/8 post free from THE AQUARIST, BRENTFORD: MIDDLESEX

74
Three Aquarium Gadgets in One

by H. K. SAYER

An aquarist is frequently needing tools or gadgets of various kinds when maintaining and setting up his aquarium. If he has a different tool for each job he finds himself with a collection that needs considerable space for storage. It is obviously better if each tool has a handle at least a little longer than the water is deep, to avoid disturbing the fish by a pair of hands working in the water, so, with the idea of avoiding a clutter of long handled tools, I made this gadget.

It is really a long handle with various easily detachable tool-heads. It will bury the roots of plants in the gravel, dig them up without damaging the roots, move quantities of gravel from one part of the tank to another, scrape algae from the glass and, with the aid of a piece of bent wire, prune unwanted leaves from plants. Now, don't think making this will be a job beyond your ability. It is all extremely simple and anyone who has, or who can borrow, a knife and a pair of pliers, with tin snips as well if they need the shovel, can make this for less than a shilling, and that is at present day prices!

The basis of the tool is a piece of brass channel originally designed to connect lengths of curtain rail; it can be bought for threepence at any store dealing in this rail. The piece, which is shaped as in figure A, has a screw in each end to hold the curtain rail tightly in position, but in my aquarium gadget one screw is used to hold the handle and the other secures one of the tool heads. The handle is a length of bamboo cane which has been split lengthways, and cut to fit the brass holder tightly. When the cane is cut, remove the centre pithy wood. The outer wood is very tough and pliable and its strength will not be affected by the removal of all the softer wood. The cane should fit about half way along the slot in the brass and the screw can then be tightened to hold the cane firmly in position.

Now to make the various heads. The ideal material for this is the soft galvanised wire sold for use in the garden; it should be just thin enough to go into the slot in the brass when doubled as shown in figure C. Incidentally the right sort of wire is used to bind egg and cheese cases and grocers throw it away.

Figure B shows how the wire is bent round a single edged razor blade to form a glass scraper. Note the angle of the blade to the handle as this assists in holding the blade rigid. Make the loop for fitting into the tool head slightly wide at A. Then, when it is pushed into the brass socket the end loops will be drawn tightly round the blade. Plants can be pruned with this blade if a length of wire with a small loop at one end is hooked under the plant at the point where the cut is to be made. Then the razor blade is pushed down and the cut made against the outer side of the wire.

The planting tool is very simply made by bending a piece of the wire into a tight flat coil about half an inch wide, then bending a loop to fit the brass holder at an angle of about 130 degrees as shown in figure C. To use this tool press the roots of the plant well down into the gravel under the flat side of the tool, then, with a series of very short up and down movements, gradually lift the tool from the gravel. The roots will stay buried. If the roots are long start burying near the plant and work out to the root tips.

Almost any sheet metal can be used for the shovel, but aluminium which is stocked by most garages, is very suitable. Though fairly thick it is easily bent and cut to shape, and does not rust or corrode. Cut the metal to the shape shown in figure D; bend the back and sides at right angles to the base and fold the side tabs round the back. If aluminium or other thick metal is used there will be no need to solder or rivet the joints.

I have found that this gadget with the tools described does most of the jobs in an aquarium, but if you have any other favourite tool of your own, it can almost certainly be adapted to fit this holder.

Hoping to breed tropicals?

You will want to see the latest of The Aquarist series of booklets

EXOTIC EGG-LAYING FISHES

by Jack Heims

The beginner's introduction to methods of breeding popular tropical species

With colour plates and photographs

2/6 post free from

THE AQUARIST,
BRENTFORD : MIDDLESEX
Perhaps the reason I receive so many angel fishes is because the corps are so remarkably healthy-looking and give so little indication of what might have been wrong.

Siamese Fighter Disease

Siamese fighters enjoy their own predominant disease. It was in one of these fishes I first encountered it, and losses from it during the past few months have been very great indeed. In this case it is an endoparasitic fungus, *Ichthyophonus*, and the species most commonly involved is *I. hoferi*. There are two other species, *I. intestinalis* and *I. latae*, of which, so far, I have identified only the former, and in which black or speckled moles are often noticed in the mouth and throat or on the ventricle. This infection comprises numerous, irregularly surfaced, roughly spherical, hyaline cysts containing yellow, brown and sometimes black granules, each spherical spore in the outer hyaline covering. Sometimes one finds large numbers of such cysts about a tenth to half a millimetre in size and all separate, but on other occasions the cysts are enlarged, often to bulk and throwing out two or three side sprouts—somewhat reminiscent of a stationary Amenoba—and grossly compressing the tissue in which they live. This apparent increase in stage and the fungus becomes large enough to be visible to the naked eye. Compared with the tissue in which it is developing the fungus is quite tough and on dissection feels rather leathery and somewhat gritty. These may affect all the organs including the heart itself, but in those instances where it is localised it is nearly always in the kidneys. I have also found the cysts in the brain of fishes, but I am of the opinion that in most cases death occurs through failure of other organs before the brain is affected. When it does reach the brain it results in staggery, loss of balance, and very erratic swimming. That, however, is but one of the symptoms of the trouble and by no means a general one.

Symptoms are not clearly defined, nor even very consistent. It appears to depend upon the main seat of infection. In some cases where the main body tissues are affected, especially in Siamese fighters, there is a clouding and dulling of the eye which may also be accompanied by raw sores, usually on the shoulders, or by broken boils or tumours. When infection occurs amongst the entrails the stomach of the fish becomes distended and may be accompanied by droppings of foamy, yellowish lumps. The fish may then either be eaten by a pike or may die. The disease may also be accompanied by violent or lingering symptoms indicated in the usual manner by "proud" or outstanding scales. Where the liver is badly affected and the gall bladder subject to pressure there may be a very marked jaundice and other symptoms, and the whole of the under part of the body becomes a muddy yellow colour. This, of course, is most obvious in Cambodian fighters. When the infection is mainly distributed throughout the whole of the body and in all organs, the symptoms are often no more than extreme lassitude, which persists without any other visual sign up to the time of death.

Although predominate in fighters, *Ichthyophonus* is much more widespread than the other diseases I have noticed; I have found odd cases in most species. So far as frequency of infection is concerned, next in importance to fighters are dwarf, three spot gouramis and paradise fishes, in that order. Angelfish, on the other hand, seem to be almost immune to the trouble.

Ichthyophonus in Coldwater Fishes

I must not overlook coldwater fishes, as during the past three months there has been a remarkable incidence of *Ichthyophonus* infection amongst shubunkins and goldfishes. It is interesting to note that in most of these cases the disease has been localised in the kidneys. One marked exception was a shubunkin examined recently which was infected with *Ichthyophonus* cysts in a vegetative state, in all organs including the heart. This particular specimen was badly emaciated.

Most of the other coldwater fishes have displayed little external signs of the trouble, and some of them have appeared to be almost perfectly externally, merely moping at the surface of the water and often dying in an upright position. In some cases there have been also gill parasites, such as flakes, Cladodes, Oxylochaeta and Costia, the particular symptoms of each having completely masked the *Ichthyophonus* trouble.

Despite the growing frequency with which I am encountering *Ichthyophonus* disease I cannot regard it as exceptionally infectious. It may be transmitted by means of spores in excreta, and therefore dirty tanks and overcrowding, as in the case of sporozoan diseases, becomes the epidemic factor. As is to be expected, following such a long period of low temperatures and sunless weather, outdoor coldwater fishes in early spring are more than usually debilitated and this may account for the exceptionally heavy *Ichthyophonus* infections I have been finding.

Livebearer Troubles

I suppose the most commonly kept of all tropical fishes are swordtails and platies. My records do not indicate any diseases particularly specific to them. So many are badly bred and from run-out strains that they are constitutionally weakened to the extent of being practically non-resistant to anything which happens to be about. Of all kinds of fishes, however, they are the most susceptible to gill flakes (Dactylopterus, mainly) and are generally the source of its introduction into the community tank.

Black and speckled mollies, and hybrids with heavily pigmented foreheads, are particularly subject to melanosis. This is a functional disorder which may be described in broad terms as being akin to blood poisoning from disintegration of unstable black pigment. The well-known "shimmery" is a major symptom and may occur when the fish is affected and the question arises as to whether they are diseased.

Although I do not know of any cause at all, a whole brood of fishes developing the trouble at the same age, in which circumstance it can be attributable to an inherent functional weakness.

This brief survey of the situation is intended as a broad pointer to where trouble may be expected in different kinds of fishes, but I must conclude by reiterating the warning that it is most unwise ever to take anything for granted. Diagnosis of fish diseases is an exact science and not guesswork.
Perhaps the reason I receive so many angel fishes is because the corpses are so remarkably healthy-looking and give so little indication of what might have been wrong.

**Siamese Fighter Disease**

Siamese fighters enjoy their own predominant disease. It was in one of these fishes I first encountered it, and losses from it during the past few months have been very great indeed. In this case it is an endoparasitic fungus, *Ichthyophonus*, and the species most commonly involved is *I. hoferi*. There are two other species, *I. intestinalis* and *I. lotae*, of which, so far, I have identified only the former, and that only in black or speckled mollies.

This infection comprises numerous, irregularly surfaced, roughly spherical, hyaline cysts containing yellow-brown, and sometimes black granules, with spherical spores in the outer hyaline covering. Sometimes one finds large numbers of such cysts about a tenth to half a millimetre in size and all separate, but on other occasions the cysts are enlarging their bulk and throwing out two or three side sprouts—somewhat reminiscent of a stationary *Anisidae—* and grossly compressing the tissue in which they live. This apparently is a vegetative stage and the fungus becomes large enough to be visible to the naked eye. Compared with the disease in those instances where it is localised it is nearly always in the kidneys. I have also found the cysts in the brain of fishes, but I am of the opinion that in most cases death occurs through failure of other organs before the brain is affected. When it does reach the brain it results in stagger, loss of balance and very erratic swimming. That, however, is but one of the symptoms of the trouble and by no means the most important.

Symptoms are not clearly defined, nor even very consistent, and appear to depend upon the main seat of infection. In those cases where the main body tissues are affected, especially in Siamese fighters, there is a clouding and discoloration of the colour which may also be accompanied by raw sores, usually on the shoulders, or by unbroken boils or tumours. When this occurs in other species, the sores are usually localized in the stomach and the disease appears to be more widespread throughout the body. In such instances the scales are lost and the fish becomes distended and may be accompanied by a droppings which is indicated in the usual manner by "peeling" or "outstanding scales." Where the liver is badly affected and the gall bladder subject to pressure there may be very marked jaundice symptoms, and the whole of the under part of the body becomes a muddy yellow colour. This, of course, is most obvious in Siamese fighters. When the infection is very widespread throughout the whole of the body tissues and in all organs, the symptoms are often no more than extreme lassitude, which persists without any other visual sign up to the time of death.

Although predominating in fighters, *Ichthyophonus* is much more widespread than the other diseases I have mentioned; I have found odd cases in most species. So far as frequency of infection is concerned, next in importance to fighters are dwarf, three spot gouramis and paradise fishes, in that order. Angel fishes, on the other hand, seem to be almost immune to the trouble.

**Ichthyophonus in Coldwater Fishes**

I must not overlook coldwater fishes, as during the past three months there has been a remarkable incidence of *Ichthyophonus* infection amongst shubunkins and goldfishes. It is interesting to note that in most of these cases this disease has been localised in the kidneys. One marked exception was a shubunkin examined recently which was infected with *Ichthyophonus* cysts in a vegetative state, in all of its organs including the heart. This particular specimen was badly emaciated.

Most of the other coldwater fishes have displayed little external signs of the trouble, and some of them have appeared to be almost perfect externally, merely browning at the surface of the water and often dying in an upright position. In some cases there have been also gill parasites, such as flukes, *Chilodon*, *Cydochepis* and *Costia*, and the particular symptoms of each having completely masked the *Ichthyophonus* trouble.

Despite the growing frequency with which I am encountering *Ichthyophonus* disease I cannot regard it as exceptionally infectious. It may be transmitted by means of spores in excreta, and therefore dirty tanks and overcrowding, as in the case of sporenous diseases, becomes the epidemic factor. As is to be expected, following such a long period of low temperatures and sunless weather, outdoor coldwater fishes in early spring are more than usually debilitated and this may account for the exceptionally heavy *Ichthyophonus* infections I have been finding.

**Livebearer Troubles**

I suppose the most commonly kept of all tropical fishes are swordtails and platys. My records do not indicate any diseases particularly specific to them. So many are badly bred and from run-out strains that they are constitutionally weakened to the extent of being practically non-resistant to anything which happens to be about. Of all kinds of fishes, however, they are the most susceptible to gill flukes (Dactylogyrus, mainly) and are generally the source of its introduction into the commensal fish. Black and speckled mollies, and hybrids with heavily pigmented forebears, are particularly subject to melanosis. This is a functional disorder which may be described in broad terms as being akin to blood poisoning from the disintegration of unstable black pigment. The well-known "shimming" is a major symptom and may occur when the toxins affect the nervous system, whilst the quite frequent upward curve of the body, with the tail trying to touch the head, results from a similar effect on the spinal cord. In most cases melanosis is accompanied or caused by pathological factors, but it may result from improper living conditions or just before or just after the birth of young. Occasionally there is no obvious cause at all, a whole brood of fishes developing the trouble at the same age, in which circumstance it can be attributable to an inherent functional weakness.

This brief survey of the situation is intended as a broad pointer to where trouble may be expected in different kinds of fishes, but I must conclude by retracting the warning that it is most unwise to take anything for granted. Diagnosis of fish diseases is an exact science and not guesswork.
I have seen it stated that it is best to put some earth under the sand when setting up an aquarium. I have also seen this method deprecated; what do you think is the better method?

There are several reasons for placing water plants in the tank and so it will be as well if we consider them first and then discuss the value of earth there. One of the chief reasons for placing water plants in the tank is for their attractiveness. I have never yet seen what I call an attractive tank which does not contain at least some water plants. The set-up tanks at most shows clearly demonstrate how the addition of well-chosen plants can add to the beauty of a tank, and so I have no hesitation in saying that to make up a really beautiful tank, plants are essential.

Their attractiveness is only one of their uses, as it is well known that healthy water plants do give off oxygen in strong light and so they are of definite value for assisting in the re-oxygenation of the water and so must tend to keep the fish healthy. Now we come to another, and in my opinion one of the most important reasons for the use of plants, and that is to clear up much of the waste matter in the tank, including the droppings from the fishes. The latter would soon foul an aquarium if left for any length of time but the roots, and in some cases the leaves and stems, of some of the plants attract mulm, etc., to them and are able to utilise it in the form of a food.

It can then be readily understood that if one of the chief uses of the water plants is to use up waste matter from the fishes, if earth is placed in the tanks for the purpose of feeding them they will not do their job nearly as well. The farmer who keeps cats to catch rats and mice in his barn does not over-feed the cats or they would not keep. Another reason why I do not advise putting earth in the tank is that it will almost surely discolor the water.

This clouding up may disappear in a few days, but it is no use washing your sand if you are going to put earth in as well, for this may contain so many impurities that it is impossible to tell whether anything harmful to the fishes has been introduced at the same time. Of course, if you only require the tanks to grow water plants alone, then I think that some earth is essential as otherwise there will be no food for them. Again, fishes may be kept in a healthy condition in a tank which has water plants just weighted down with a piece of lead and no earth or sand at all in the bottom of the tank. I have seen such a tank in use and it is noticeable that most of the waste mulm has been attracted to the roots of the plants; the plants appear quite healthy under these conditions and the fishes seem happy.

Two of my tanks are set up with plants and fishes. One has fine sand in the bottom and this tank keeps quite clear. The other has very coarse sand at the bottom and is always cloudy, although I feed and attend to the two tanks in a similar manner. Can you tell me why this should be?

It appears fairly obvious to me that the tank with the coarse sand at the bottom is in trouble because particles of uneaten food have dropped into the crevices between the small stones and have there gone putrid. Food left like this can pollute the water in a day or two, whereas if the sand is fine then the food does not become hidden when it drops to the bottom but can be picked up easily by the fish.

I am quite aware of the fact that many aquarists recommend that only coarse sand should be used in a tank and that water plants cannot send their roots into the fine sand, but I have seen a number of very healthy tanks which have only fine sand in the bottoms. The fish are able to eat all the food which falls and by the look of the plants they seem to be able to root into the fine sand without any apparent difficulty. The specimens tanks which I have seen set up with fine sand have been in every way as good as those I have seen with coarser sand, so I am now inclined to favour the use of fine sand for this purpose.

I cannot make up my mind whether to put snails in my new pond. Some books say "No snails if you want to breed in the pond," whilst others say that snails are essential. Which is the better plan?

I consider that snails in the pond are less essential than water plants, and therefore they can be dispensed with. On the other hand snails will eat a certain amount of decaying vegetation and dead animal matter. In this way they are of some value, and as their young provide some useful food for the fishes it can be taken that it is beneficial to include a few when pond stocking. Against this view it must be stated that snails will eat some of the eggs of the fish when they are laid; they will not interfere in any way with live fry however small.

Some types of snails eat growing water plants and the Lymnaea stagnalis is one of the worst for this. The Planorbis types, on the other hand, rarely eat growing plants but seem fond of decaying vegetation. If you do use snails in the pond (and remember, they can be done without), then see that you are in a position to take out some of the water plants which have eggs on them so that these have a good chance to hatch out in safety.

I have a very good common goldfish which has won at more than one show. I now notice that a few of its scales are missing. Shall I still be able to exhibit the fish or will it be disqualified?

You can still exhibit your fish and it can still win. A lot will depend on the amount of damage, but as a rule only five points are allotted for condition and so if your fish is very good otherwise it may still be successful. A knowledgeable judge will make allowances for a missing scale or two as he will appreciate the fact that these may have been knocked off when the fish was caught, or whilst spawning. Providing the fish has all the necessary points for its type and that its general health is good, a judge should not down-point too much a fish which shows some small signs of recent damage. He knows that the fish has been all right and in all probability will soon be all right again. If the other hand the fish has a number of damaged fins and shows general signs of wear and tear then the judge may quite rightly pass it by for another fish in better condition, although it may not be such a good or typical specimen. So much depends on the amount of damage.  

78  THE AQUARIST
THE guppy and the zebra danio are in many ways ideal for you to begin tropical fish keeping. Both of them are very lively and decorative, and furthermore, they are quite cheap.

The guppy is a member of the livebearer family, i.e., it appears to be viviparous (see the definitions below). As is usual with livebearers, the female is considerably larger than the male. A good sized adult female guppy is a little more than two inches long, whilst the male, at his largest, is just over an inch long. The coloration, however, is a different matter. Here the male is far more conspicuous. Even commonplace male guppies have the most exquisite colouring, and no two fish are exactly alike. They are covered in spots, rosettes and patches of many beautiful tints. A male which I once possessed, had patches of a clear, pale green—a colour seldom seen in other fish. Most female guppies are grey-brown in colour. Black dorsal and caudal fins have recently been bred in female Robson guppies.

Guppy Breeding

Guppy breeding has become a hobby in itself. There is now a society, the Guppy Breeders’ Society, devoted entirely to this one fish. Several varieties have been produced. With the exception of the Robson guppy, these are named after the tail or caudal fin shape of the male. There are top, bottom and double swords, speartails and roundtails and others besides. Although so much care is lavished on the guppy, it is possible to buy a pair of the common variety for a shilling or two at most aquatic dealers. Breeding guppies presents no problems. Keeping them in check seems to be the difficulty. They are so prolific that some aquarists use them as live food for carnivorous fish. It is far better to buy one or two pairs of guppies and let them breed to fill the space available than to stock the tank completely at the outset. As adult guppies are particularly fond of eating their young, some bunches of fine vegetation are desirable. Myriophyllum, which we will mention later, is ideal.

Zebra Danios

Our second fish, the zebra danio, is oviparous. It is even more lively than the guppy; a few zebras darting swiftly after their food are always attractive. The background colour is pale yellow, and on this are several dark blue longitudinal stripes. These bands give the fish its popular name, though the stripes of the quadraped zebra run around the body, not along it. Both sexes are about one and three-quarters of an inch long. Sexing this fish is not easy, but when they are filling out with spawn the females are a little more rotund than the males. They are slightly more expensive than guppies; the usual retail price is about half a crown each.

Spawning zebras is not difficult, but preventing the eggs being eaten is. The spawn, which is not adhesive, sinks to the bottom of the aquarium and hatches there. Some forms of a breeding trap, with a mesh bottom to allow the eggs to pass through, is often used. Since the parents will eat both the eggs and the fry, two aquaria are necessary if you wish to rear a whole brood of zebra danios.

Both guppies and zebras are omnivorous. Do not feed them entirely on dried foods; they benefit greatly from frequent and varied live foods.

Two Tropical Plants

Sagittaria natans and Myriophyllum are excellent plants for the tropical aquarium, but they are both used to a certain extent in coldwater tanks. Before buying any, make sure that they have been grown in tropical aquaria. If they have been grown in cold water and are then put into warm water, they will grow far too quickly without taking root properly and will eventually turn yellow and wither. Sagittaria natans resembles Vallonia in its mode of vegetative reproduction. Young plants are produced on runners and root themselves in the sand. The leaves, which float on the surface, are oblong and about two inches in length. Occasionally small white flowers appear. Myriophyllum exists in several varieties with colours ranging from ruddy-brown to green. All have a fairly tough stem with many finely divided leaves giving it the appearance of a test-tube brush. It is propagated by cuttings and is excellent cover for small fry.

Definitions

Viviparous. Producing live young from the parent, in whose body they have been dependent on it. In the aquarium this is usually supplied by special organs. Mammals are viviparous. Love-bearing tropical fishes such as the guppy, are not truly viviparous.

Oviparous. Reproducing by means of eggs from which the young hatch later. The majority of aquarium fishes are oviparous—the goldfish and zebra danio are examples.

Ooviviparous. Reproducing by means of eggs which are developed and hatched before birth within the parent’s body. The British viper or adder and the Pocilloid family of tropical fishes, including the guppy, are ooviviparous.

Cull the Runts!

It is not worth your time and trouble to try and keep any fishes from a hatching that show signs of weakness or undevelopment. Their presence in the tank can retard the growth of the others, and it is far better to remove them at once than to keep them in the hope that they will improve. Remember that space is an important factor in determining the rate of growth of fishes, so to get the best specimens give them every encouragement by early removal of the runts.

July, 1951
New Sea-front Aquarium

OPENED in May this year, the underground aquarium at Southsea, on the south coast, is situated opposite the South Parade Pier. The public galleries are kept in semi-darkness and the aquarium's 66 exhibits of marine, tropical, coldwater and reptile life are brightly illuminated from above, behind the walls of the aquarium.

The marine tanks—four large thousand gallon tanks made of reinforced concrete, were in process of being set up when The Aquarist visited the aquarium last month, but the curator at Southsea, Mr. H. Sinclair (until recently curator at Paignton Zoo Aquarium) informed us that he plans to experiment in keeping deep sea specimens in these aquaria. Sea water, collected from five miles out, is circulated and filtered through sand between these exhibits by means of a centrifugal pump.

Filtration is also a feature of all the other smaller marine aquaria and tanks in the coldwater and tropical sections. In tanks of the last two classes a new type of internal filter is being used in which the filter medium (fine sand) is beneath the sand in the aquarium itself. Air for operating these filters is supplied from a compressor line with gauges at strategic points behind the exhibition tanks.

In plan the aquarium is approximately square, its sides formed by the large coldwater, marine, tropical
Aquarium at Southsea

and reptile tanks and cases, which enclose two large "blocks" of tanks—one coldwater and one tropical. Roomy gangways for the public are allowed between these blocks and the main walls. A large pond with a water cascade is a feature of one corner of the aquarium.

Tank No. 47 in the coldwater section, containing a shoal of golden rudd. All tanks are backed with painted boards.

Public gangway displaying the tropical aquaria, which occupy one side of the Aquarium and also form a central "block" display.

Filter used at the back of a small marine tank containing sea-horses. Graded sand and shingle is the filter medium and the water circulates by siphon and air-lift into and out of this tank.

forced concrete sea water tanks filled with the tank to the right in which a workman is working medium for the circulated water. Concrete bared on the surface.

Inside one of the "blocks" of coldwater tanks. The air line supplying air at 5 lbs pressure from a 2 h.p. motor and compressor is seen running above the aquaria below the heating and lighting points.
Beautiful Gentians Round the Pool

by W. E. SHEWELL-COOPER

MOST people want to grow the gentians because of the wonderful blue colour of the flowers. Few, however, know that there is a white species from New Zealand. There’s a golden yellow known as buts and a lovely scarlet and gold called Gentiana scarletina, but generally speaking, there is no other genus in the world that produces more gorgeous blooms than the gentian as a whole. Unfortunately, it is impossible to lay down any hard and fast rule as to how these plants may be grown because the requirements of the species differ so widely, but the flowering season extends over six months and you can start in April and May with a variety like G. acutus and end late in October with G. sino-ornata.

It is possible to give a few general hints as to the cultivation of these beautiful plants: on the whole it can be said that lime can be left out of a soil mixture except in the exceptional cases of species which are known to require it. Usually the Asiatic species are lime lovers; most of the easiest varieties to grow are lime haters. The North American species and the Japanese species are either bog or woodland plants—they like to grow in plenty of heat with lots of moisture. The New Zealand species insist on plenty of good drainage and seem to prefer to be in the upper parts of a rockery. So find out where the plants originally come from and then plant them accordingly.

I now want to mention a number of the easiest gentians to grow and to say something about them. We will start with G. acutus, which has certainly been known and named since 1753. It does quite well as an edging along paths and it is a lovely sight when in full bloom. In such cases, it is lifted every fourth year as a rule in order to be split up and re-planted. It can be the most annoying plant because it can grow and grow and not flower at all. I find that it pays to try it in different positions in the garden. It must have moisture. It insists on perfect drainage and it loves to be in a spot where it gets plenty of sunshine and air. It dislikes lime and I think on the whole, prefers a fairly heavy soil. It flowers during the late spring and early summer.

One of the New Zealand plants is G. baldianloa. This likes lime-free soil with a little peat. It usually grows about six inches in height and flowers during June and July. It has a long stiff root and likes a deep soil for this reason; if the drainage is good and yet there’s enough moisture in the summer, it seems to be able to stand the very bad winters we sometimes get.

Gentiana dahurica comes to us from Asia Minor. It likes perfect drainage and full sun, the flower being of a pale purplish blue. It looks at its best during August and September. It is thought by some gardeners to be the best of the gentians, for the flowers are of a luminous Cambridge blue with a lovely white throat. I like farreri because it is really hardy; I have seen it growing in all kinds of soils providing these are free from lime. It likes moisture below and plenty of sunshine above.

A very graceful species is G. hexaphylla which was first discovered in 1894, though I am told was grown successfully in Great Britain until 1916. It sends up a great many shoots and grows in the early stages very much like a cushion saxifrage, for the leaves are quite small and they are arranged in whorls of six. See that the soil in which it grows is free from lime, plant it in a place where it will get plenty of sun and it will start to flower towards the end of July and go on blooming for the whole of August.

You should not have any difficulty in growing G. lagodechiana. It likes the moister parts of the rock garden, for it comes from the Eastern Caucasus and grows about 15 inches high, the flowers being deep blue on the inside and paler on the outside with greenish spots within the tube. It is (Please turn to page 85)

Pond in the Picture—2

This small attractive pool forms the centre-piece of a sunken garden at Pinkers Green. It provides the moist setting in which a great variety of plants will grow; the chinks between pieces of crazy paving have been used for this purpose. The pool’s essential simplicity makes it an ideal model for a similar one in a small garden.

Photo: H. V. Joel

THE AQUARIST
How Long do Carp Live?

by

JACK HEMS

THE wise Izaak Walton, commenting on the longevity of carp remarks: "The age of carp is by Sir Francis Bacon, in his History of Life and Death, observed to be but ten years; yet others think they live longer. Geo. Gesner, says, a carp has been known to live in the Palantine for above a hundred years." And from those early times until the beginning of the present century, most writers on natural and un-natural history were quite firm in their belief that carp were as long-lived as any of the fabulous creatures which figured in the fertile minds of their creators.

Most people have heard about the 19 feet pike which, according to Gesner, was hauled out of some German lake (the exact geographical position varies with different authorities) in 1497. Around this fish's gills hung a brass halter inscribed: "I am the first fish that was placed in this pond by the hand of Frederick II, Governor of the World, on the 5th October, 1230." At one time in the long age the supposed skeleton of this remarkable fish could be inspected in a museum at Mannheim; but scientists who subjected it to a close examination were of the opinion that the vertebrae had been lengthened to fit the story. But to return to the subject under discussion.

Fontainebleau Myth

"Carp live to a very great age," writes Edward Bairstow in his treatise The Aquaria, published in London in 1910. And he goes on to inform us that: "Carp of the ponds of Fontainebleau are said to have been placed there by Francis I." But Bairstow and many of his contemporaries writing in a similar strain omit to tell their readers that the ponds of Fontainebleau were emptied and refilled about a dozen times between the French Revolution of 1789 and the collapse and defeat of Napoleon Bonaparte's great conglomeration army in the bitter snows of Russia in 1812. These facts may conjure up the picture of fat-sided fish being scooped up out of the mud by hungry people. And that, indeed, was the fate of most, if not all, of them; for, to quote Blanchard: "At the beginning of the nineteenth century the fish farms fell under the control of the sovereign people, who allowed the carp to permit great size or age to be an obstacle to its ministering to their stomachs."

"Hoary with Age"

Apart from a fondness for quoting the erroneous ideas of earlier authors, many of those who liked to perpetuate the belief in centenarian carp used to focus attention on the greyish-white scum which often clothed the fish's sides, and assert that no further proof was needed of their antiquity. For instance, the anonymous author of a Compendium of Natural History, published in London in 1812, has the passage: "In the canals of Chantilly, formerly the seat of the Prince of Condé, Carp have been kept for above a hundred years, most of them appearing hoary through old age." And owing to the reiterated of such nonsense, the idea persisted well into the late Victorian era that the carp of Fontainebleau and Chantilly were the identical fish which, in their younger days, had been fed with tit-bits from the delicate fingers of Queen Marie-Antoinette and her ladies-in-waiting.

Present day students of fish life know that the whitened sides of carp have no connection with age, but is an indication of disease (Saprolegnia ferox), which often affects cyprinids during the spring and summer. As for the argument so often put forward that large carp must be very old carp, it must be borne in mind that carp grow very quickly in mud- or clay-bottomed waters, especially those having a luxuriant growth of submerged vegetation. The countless numbers of small crustaceans and molluscs that breed in dense masses of underwater plant life keep the fish well-supplied with food and the plants themselves provide an excellent alternative form of nourishment.

Cautious Carp

Perhaps much of the mystery surrounding the life span of carp can be attributed to the fact that identifiable fish will often continue to flourish in a lake regularly visited by anglers. As Izaak Walton observes: "He is a very subtil fish, and hard to be caught." Indeed, there are times when carp will steadfastly refuse the most tempting bait, thought up by the expert angler; and once having experienced the prick of the barbed hook, the carp becomes extraordinarily cautious and will not be persuaded to bite again at the twitching gentle or the bright red worm. Hence it is quite easy to understand how such cunning fish become tricked into a legend.

There has been used for several decades a sure way of determining the age of a reputed centenarian among fish: that is by examining under a lens the rings or annuli formed on the scales during its lifetime. As most of us know, growth of the scales is accomplished by addition of bony substance at the edges. The concentric lines of growth are wider and more numerous in spring and summer when food is more plentiful than during the lean days of winter; so by examining the zones of slow and rapid growth on a scale it is possible to work out the approximate age of the fish.

No Centenarians

C. S. Gerrish, an authority on the age and growth of coarse fish records that all the scales of carp he has examined belong to comparatively young fish. "The largest whose scales I have seen weighed 13 lb., and was no more than fifteen years old." C. Tate Regan writes: "Although there is good reason to believe that under artificial conditions these fish (carp) may attain a good old age, it is doubtful whether it exceeds fifteen years in a wild state." And this view is shared by most reliable French and German ichthyologists.

Of carp kept in the sheltered conditions of a public aquarium, we have yet to hear of one that has lived for so long as half a century. Perhaps the longest-lived aquarium carp is (or was) one kept in the Berlin Aquarium. This fish was said to be about thirty-seven years old when Hitler sent his Nazi hordes storming across Poland. The fish may be alive now. Who knows? Of one thing we can be certain: centenarian carp have never existed except in the fruitful imagination of man.

ADVERTISMENT in a Stoke-on-Trent newspaper:
AQUARIUM (10 tropical fish) size 30 ft. x 12 ft., with bow front, fully equipped, compl., on Framed Table.

—Ring,— Overcrowding fishes is a deadly sin!
Talking about Tubifex

Collection of Tubifex

OW many aquarists living near rivers realise how easy it is to collect their own Tubifex? I live close to the Thames, and at low tide a stretch of the bank at Chiswick is carpeted with this wriggling live food in the top of the mud.

To collect the worms all that is necessary is to scoop up a pickle jar full of the surface mud from between the stones and suspend this in a muslin cloth that just dips into a pail of clean water. The worms slowly wriggle through, and they can be kept under a running tap for an hour or so to wash away unwanted matter and eliminate chances of infection to your fishes with pests from the river.

Remember that the worms are not always to be seen unless the mud is disturbed, so examine that mud in the shallows of your local river again—it may prove a rich source of live food for you.

W. E. Hadfield

Storing Tubifex

ERE is a method of storing Tubifex so that a large quantity of the worms will live over a period of four to six weeks away from their natural surroundings.

A large number of the worms placed in a jar soon forms a tight ball, and the worms in the centre of the ball perish. If the mass is broken into a number of smaller ones, each lot being placed in a separate jar, the trouble is then that the average household has insufficient dripping taps beneath which the jars can be placed.

My method of overcoming this snag is shown in the illustration. A wooden trough carrying a water-saturated roll of cloth is placed in the bath so that the tap drips on to the roll. Strands of wool sticking through the bottom of the trough conduct a steady stream of drips into jars placed beneath them. Each jar contains a not-too-large ball of Tubifex that is kept in a good fresh condition.

It is, of course, easy to lift the apparatus and jars from the bath together if a stand is made to take them and the trough.

K. Reid

Tubifex Troubles

A COMPARATIVE newcomer to tropical fish-keeping, it was some time before I discovered that convenient food the Tubifex worm. I was delighted with it; here was a natural and easily obtainable form of live food which seemed to be greatly appreciated by all my fish and one, also, that had the advantage of reasonable survival under unnatural storage conditions. This, I felt, was the answer to all my worries about live food, which my books assured me was vital for keeping fish in reasonable condition.

Consequently, I happily hung Tubifex into my one community tank for several months and my fish gorged themselves until they could scarcely wiggle—their fins stood out like sails, the livebearers live-bore and the rosy barbs almost turned scarlet. Never before had my fish appeared to be in such fine condition as they now became after this regular fleshly diet. But, as usual, this peaceful state of affairs was not destined to last for long.

One morning, whilst casting a contented eye over the inhabitants of my tank, I was horrified to notice my pair of red playts skulking in a corner, looking decidedly unwell. These I segregated in an old glass battery case and kept a watchful eye on my main tank. A female moon playt was the only other fish to succumb and was soon added to my invalids. These I kept separate for some few days and the male red playt soon returned to normal health and was moved out of the hospital tank. The two females, however, went from bad to dreadful, their bodies just wasting away, until they resembled aquatic whippets, so that I decided in the end to destroy them.

This sudden death rate among the playts perturbed me, particularly as the rapid falling away of the flesh of the fish was unlike any other symptoms that my fish had displayed during their previous illnesses. I felt sure that the Tubifex worm must be the culprit, for nothing else but dried food had been added to the tank. How to deal with this emergency was a problem, for I’d no idea what the trouble could be.

Eager for knowledge, therefore, I cast around amongst my fishy friends to see if they could throw any light on this treacherous Tubifex. And, of course, they could; a whole encyclopaedia of information was forthcoming of varied authority and I accepted it in the kindly way in which it was offered. It’s a curious trait amongst aquarists that they just love to give advice to others, even though they may have no accurate knowledge to impart. I know—for I’m an enthusiastic adviser myself. From the various suggestions two theories appeared to prevail.

The first theory is that the playts swallow the Tubifex, which are far too big for them, and they consequently suffer from indigestion and stop taking food and ultimately die. Comparing the relative lengths of my playts and the Tubifex this seemed extremely feasible, for the speed that the fish devoured the worms seemed to preclude any mastication. So I commenced to chop my Tubifex; thus delights the smaller inhabitants of my community tank but is distinctly frowned upon by the more voracious inhabitants who have to swim twice as far to collect half as much.

The alternative theory, which sounds extremely scientific to me, is that the Tubifex is a carrier of some obscure form of even smaller worm, rather on the “bigger fleas and lesser (Continued on the opposite page)
Wall Lizards

by IRIS MURRAY

Wall lizards are typical Old World specimens of the true lizard family (Lacertidae) and there are so many species and varieties that herpetologists have never been able to agree as to the exact number. Colours of these lizards vary—blue, brown and grey, with black and darker markings, and the average size is between six and eight inches.

Wall lizards are widely distributed over Asia, Africa, and in Europe as far north as Belgium and Southern Germany. Like all members of the Lacertidae they are carnivorous, living on insects, snails and worms, while some of the larger specimens often turn cannibalistic and feed on their smaller relations. They appear to be fond of sweet food and sugar, and must be kept supplied with water to drink when kept in vivaria.

During the warm or hot sunny days in the Mediterranean area, they can be seen darting over walls or rocks searching for insects. Wall lizards possess digits which have smooth tubercular lamellae underneath, enabling the creature to cling to smooth vertical surfaces. In some south European countries where open air film-shows are given with white-washed walls used as screens, amazing results often occur when two or three curious lizards make their appearance together with a glamorous film-star! They love to frisk about or bask in the sun, but on dull grey days they can usually be found beneath a stone or in a crevice, in a lethargic state.

When the heat of the sun attracts them from their homes, at the first sign of danger they scuttle back to exactly the same spot. If, however, they are removed from the locality of their hide-outs, they become decidedly flustered and are easily trapped. In spite of the fact that they are shy creatures, they are curious and this often leads to their downfall. They can be caught comparatively easily by attaching a noose to the end of a rod, and putting it over the lizard's neck. This method has been used in Italy for the past 2,000 years.

The hibernation period is neither long nor deep, and often on occasional warm days in winter, they can be seen basking in the sun. If plenty of climbing space is provided, and they are protected from frost, these hardy lizards will adapt themselves quite well to living in a dry sandy vivarium, feeding on meal-worms, flies and grass-hoppers and becoming quite tame if treated properly.

*Lacerta muralis* is the common wall lizard most often available in pet shops. Males are more colourful than the females and show black markings as well as traces of blue and green.

---

**Tubifex Troubles**

(Continued from the opposite page)

*By Cedric Watts*

fleas ** basis. This minute worm apparently attacks the embryo young in the female, causing them to rot away and destroy the parent fish. Don’t quite see how this explains my sickly male platy, but maybe he just had a bad hangover. Under this theory the cure appears to be to wash the *Tubifex* thoroughly and frequently, for this parasite apparently dislikes clean water as much as my young son.

So now I wash my *Tubifex* in streams of running water in the bath, a habit which delights my son but horrifies my wife. Then I assiduously chop them into the smallest pieces and feed the fish. No more fatal maladies have occurred since I’ve been pursuing this policy and I haven’t changed it in case they re-occur. But I’d be glad to know if there is a chance that one day I will be able to return to the halcyon days of feeding unwashed, complete *Tubifex* to grateful fish, safe in the knowledge that all the time my troubles were caused by too much starchy dry food.

July, 1951

---

**Beautiful Gentians**

(Continued from page 82)

grand in late August and during most of September, and grows in any good garden soil which is retentive of moisture. Like all its friends, it asks for full sun. A species which doesn’t present any difficulty at all providing there is plenty of moisture is *G. zibethinus*. It forms a mass of shoots which may be six inches long and comes into bloom about the end of July; flowers are the typical blue with a white tip.

To end with, there is *G. sino-ornata*, which was discovered by Forrest in Yunnan in 1904. It undoubtedly the best gentian that has ever been sent to this country. It is easy to propagate, grows well, flowers late and it throws plenty of blooms at that. The colour is royal blue and on the outside of the flowers are broad bands of purplish blue interspaced with yellowy green markings. It likes a rich soil, plenty of moisture and no lime. It flowers with me from September until well on in November unless there is a severe frost earlier.
Readers are invited to express their views and opinions on subjects of interest to aquarists. A selection from queries received will also be answered here. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.

British Aquarists' Festival

BOTH the British Aquarists' Festival and the General Assembly of the Federation of Northern Aquarium Societies proved to be highly successful events and were the biggest efforts of their kind to have been held in Europe. Only the organisers have any idea of the enormous amount of planning, work and effort that went into the preparation and maintenance of the B.A.F. and all its ramifications, including the organisation of the General Assembly for 1,016 aquarists and guests of the F.N.A.S. at its close. The whole Festival has been a tremendous triumph for the whole-hearted and close co-operation of publishing and editorial staff of The Aquarist and the F.N.A.S.—it has been of great value to the welfare of our hobby. The magnificent trophies and cups at the B.A.F. will no doubt lead in future years to intense and stimulating competition, with greater general improvement in standards of fish and plants. As President of the Federation I must congratulate and thank all the judges, stewards, officers and members and exhibitors, together with our colleagues in this venture from The Aquarist, all of whom contributed so much in making the first British Aquarists' Festival in Manchester such an outstanding success.

Dr. John F. Wilkinson (President),
Federation of Northern Aquarium Societies

MAY I as an amateur fish-keeper and an interested visitor to the recent B.A.F. at Manchester offer my thanks and congratulations to the sponsors and organisers for the splendid show put on there? Not being qualified to comment on the technical excellence of hundreds of tanks and their splendid occupants I may yet, perhaps, be permitted to say that the beauty of the exhibits and the clean lines of the staging gave me great pleasure.

A tremendous amount of inspired and enthusiastic hard work must have been done to produce such an outstanding aquatic display and one cannot escape the conclusion that the results have been fully in accord with the special significance attaching to the word "Festival" in the year 1951.

R. J. Matthews,
Nuneaton, Staffs.

I MUST congratulate the F.N.A.S. and The Aquarist for staging such a magnificent display of fishes at Manchester. My sympathy goes out to those who could not find their way clear to visit it. There is no question that aquarists in the north are a go-ahead lot of people, and I was much impressed with the fine quality of many of the fishes on exhibition. The dealers' stands were a sight for sore eyes—such an array of pumps, foods, plants, reptiles and fishes! It is not often that so many really rare fishes are to be seen on dealers' stands. As Frankie Howerd would say: "I was amazed!"

Jack Hems,
Leicester.

Please accept my congratulations on the excellent show and brochure at the British Aquarists' Festival, Manchester. It was excellently produced and anyone who was disappointed must have a very melancholy disposition! B. Simcock (President), Mansfield and District Aquarists' Society.

Being geographically isolated, the Hull Pond and Aquarium Society have little opportunity for comparisons with other societies. Full advantage was taken by members to rectify this on their excursion to the very fine B.A.F. at Manchester, a trip thoroughly enjoyed by all. Our thanks are due to the stewards and officials for the help and courtesy extended to us.

H. Glenston,
Hull Pond and Aquarium Society

Twenty-Five Years Ago

With reference to your note "Twenty-Five Years Ago" (The Aquarist, May), the following extract from the minutes of this society, dated 3rd November, 1927, referring to the Second Annual Exhibition of the British Aquarium Association, might be of interest—"In an interesting paper entitled 'Impressions of the B.A.A. Second Annual Exhibition,' Mr. A. C. Mcintyre gave a description of the B.A.A. Exhibition, and said there were three hundred and fifty tanks each of a capacity of six gallons. At the bottom of each tank there was a layer two inches of river sand. Thus, before any fish could be placed in these aquaria over two thousand gallons of water and half a ton of sand had been used to fill the tanks. In the exhibition there were thirty-seven classes in different sections." Since the B.A.A. would at that time be only a few years old, it says much for the pioneers of the hobby that such requiring 350 tanks could be staged, when presumably coldwater species would be available for exhibition.
**SWEDEN**

The fourth issue of *Akvariet* this year recalls the international interest roused by a fish which in 1940 received the name *Latimeria chalumnae*. In the beginning of 1959 the *Illustrated London News* contained an extensive article on the subject and in the second March number produced an illustrated supplement. The reason for this widespread interest, was that this group of fish, Crossopterygida, was supposed to be extinct and was only known to scientists through fossil remains dating from the Devonian period.

While trawling off the coast of East London, S.E. Africa, in December, 1938, a yard and half long fish weighing over a hundredweight was hauled on board. The body was covered with steel-blue plate-like scales and the large eyes were of the same colour. Several of the fins were lobular and the teeth well developed. The fish was handed over to the East London Museum. Owing to unforeseen circumstances ten days elapsed before experts were able to examine it. In a tropical climate and with poor equipment it was impossible to preserve such a monster whole. However the skin with its scales, the cranium, and parts of the backbone were kept intact. Comparison with fossil remains showed that this fish, as far as known, was the sole survivor of that prehistoric group which are the ancestors of quadrupeds.

When the trawl was emptied most of the other fish were dead or dying with the exception of *Latimeria*, which lived for three to four hours. There is a possibility of an auxiliary breathing apparatus and as the coasts of that district consist of extensive marshes it is probable that its life was not only spent in the sea. Despite all efforts no other living specimen has been found.

**LONDON ZOO AQUARIUM**

The first octopus of summer has arrived at the London Zoo, from somewhere "down south" the other side of the Channel, and is being shown with a display of educational showmanship that reflects the greatest credit upon those responsible. Instead of being isolated, and garnished with the one word "octopus," which to the average man conjures up fantastic and scientifically unsound visions of a man-devouring ogre, it is staged in its proper setting...a rock walled tank, tenanted by fishes of the rocks.

And here this seemingly strange combine will remain, in perfect harmony...until the octopus dies. For under no circumstances will the octopus, however hungry, touch a fish of any kind. It feeds only upon crustacea and some shellfish molluscs, mostly bivalves. Even in its devouring of crustaceas it gives no offence as an exhibit. It will never cause an aquarium scandal, like the "live foods for reptiles" furore, which set the Zoo afloat half a century ago. The octopus quietly envelops a crab, or small lobster, and the dismembering and methodical picking clean of all flesh is never done in public, but in the innermost obscurity of some deep rock fissure.

The tank in which this octopus is shown stands near the end of the sea water hall's northern wall, and the multi-coloured rocks reveal to perfection how the octopus's complex system of chromatophores ensure a perfect camouflage, whatever the surroundings. Altogether it is the best octopus exhibit yet presented, and one which many another aquarium might well copy.

---

**NEWS AND REVIEWS**

L. R. Brightwell

---

**THE AQUARIST CROSSWORD**

Compiled by J. LAUGHLAND

---

**CLUES ACROSS**

1. Aquatic beetle (5, 7)
2. Solo sounds spacious (4)
3. Intestine bird in moss (3)
4. Tart for mores (anagram) (5, 4, 5)
5. Doublet (4)
6. Knifefish (2)
7. From streamlet reversed (4)
8. One way of fishing (3)
9. "" — blade of grass holds its air drop of dew."" (4)
10. Colourful fish (8)
11. Non-drinkers are from vortex (1, 1)
12. Edible bivalve (6)
13. Frequent haunt of Daphnia (7)
14. Into out of confused aeration for space (4)
15. Toward its a name (2)
16. Half neon shows a point (1, 1)
17. Squid (7)
18. Still life in oil? (8)
19. Watering place (3)

---

**CLUES DOWN**

1. Send great war (anagram) (5, 7)
2. End of the scale singular is plural form (3)
3. Form of stickleback (9)
4. In fishes a rudimentary organ (3)
5. (the toad) and (the frog) confused for hison (7)
6. On-cell organism (6)
7. Last ace from castle most and boy returns (3)
8. Permaining to the sea (6)
9. Most brilliant fish (4, 5)
10. Once a (1, 1)
11. Father leaves the pies (2)
12. Where Amur is originates (1, 1)
13. End of the committee (3)
14. The one that got away from the draper (1, 1)
15. Lobster pets for example (5)
16. Halve side and I for a notion (4)
17. Usual award for winning spectaculars (4)
18. Black (4)
19. It is stressed (3)
20. Church from dusk (2)
21. Returns as part of Empire (2)

---

**PICK YOUR ANSWER**

(1 mark each. No cheating, if you please)

1. *Loudon's Char* (*Salvelinus alpinus loudonii*) is found only in: (a) Coniston Water; (b) Derwent Water; (c) Hawes Water; (d) Ullswater.
2. Enamel fin is one of the popular names of: (a) *Holocentrus scallii*; (b) *Hyphessobrycon arsenu*; (c) *Pristella riddelli*; (d) *Sphenolyra discoe*.
3. The goldfish breeders of Hangzhou call *Daphnia*: (a) Pond hoppers; (b) Golden shrimps; (c) Water lumps; (d) Pink flax.
4. "If on one is not a fish he knows not a fish's joy" was written by: (a) A Dutch naturalist; (b) A Roman emperor; (c) A French novelist; (d) A Chinese philosopher.
5. The butterfly fish (*Pseudanthias chirurgus*) can be sexed by the: (a) Shape of the anal fin; (b) Colour of the dorsal fin; (c) Markings on the caudal fin; (d) Size of the pectoral fins.
6. *Cyprinodon niger* is popularly known as: (a) The spotted characin; (b) The flying characin; (c) The striped characin; (d) The paddle-tail characin.

(Solutions on page 98)
having read both Mr. Wheeler's letter and that from Mr. Davey (The Aquarist, February and April), I would like to point out a simple way of calculating tank capacity.

This formula is a well-known one for computing the amount of water in tanks or reservoirs of all sizes, accurate to within five per cent.

Area of surface (sq. ft.) × ½ (depth of water—ins.).

If your tank contains 3 ins. sand and is filled to capacity with water the water content will be $2 \times 1 \times \frac{9}{2} = 9$ gallons.

Using the accurate formula of $L \times B \times D$ (all in feet) $\times 6.25$ gives the capacity of a 2 by 1 by 1 tank as 12.5 gallons; the simple formula gives it as 12 gallons.

I hope that this will in future help others to avoid the errors that, as Mr. Davey pointed out, have no doubt caused a great many deaths of fishes. One final point—measurements are made from sand surfaces to water level, and if, as in most tanks, the sand slopes from rear to front, the measurements are taken from the centre of the base to the base of the tank.

J. W. TAPPER, Cardiff.

Malayan Burrowing Snails

I was very interested in the article by Martin Dominic on Melania tuberculata (The Aquarist, April), but from my own observations I must disagree with several of the points he makes:

1. "Speed": they are as fast, if not faster, than Physa minor but they do their speeding after dark.

2. "Sand never disturbed": they will level any depth of sand in a short space of time unless rock barriers or other deterrents are used. I have found Perspex strips of varying depths effective and inconspicuous.

3. "Rarely climb on glass": I keep Malayan snails in nine tanks, used for growing on young stocks, and if the fish house lights are switched on at any time after dusk the front glass of the tanks are covered with them.

In conclusion, I agree with the author that they are the only snails which stand a chance of survival with cichlids, although I have seen both jewels and Brazilians worry them with little success.

J. H. DAVIS, Stoke-on-Trent.

Painless Death

In a letter on painless death that was published in January a correspondent stated that when a fish is dropped in methylated spirit it dies within a second. This is not the case. Having put a sick perma black mollie in this fluid it took about four minutes for it to die, causing the fish needless suffering. Can you please advise me of a more efficient method?

(Mrs.) N. BULLER, Harrogate.

We can only repeat the advice given last November: large fishes are best killed by a sharp blow on the head. Others can be dashed with force against a hard floor, or decapitated in one cut with a strong and sharp pair of shears or scissors. Movements following such procedures can justifiably be assumed to be unassociated with conscious pain to the fish.

Criticism of Traders

Myself and fellow club members have made a practice of going round to various dealers to try to form some idea of stocks and prices in general. You will be dismayed to hear that in our own borough alone, where we have upwards of a dozen fish dealers, only three have a working knowledge of the hobby and are fair dealers, the others being most unhelpful and seem only interested in getting rid of their wares at the most fancy prices in the shortest space of time.

My contacts with other club secretaries seem to confirm my statements, as they have experienced a similar attitude in other parts of the country. To try and obviate this state of affairs we have decided within this club to have made and issued to approved dealers a form of plaque or certificate to let non-club members and others interested in our hobby know that they can get helpful and courteous service from the dealer who displays one of the notices. If other clubs could find time to carry out similar surveys in their own areas I am sure we would gradually eliminate these "bucket-shop" dealers.

R. E. BILLINGS (Secretary), Lambeth Aquarist Society.

Tank Tapping

What are your readers' views concerning the statement made by W. T. Innes in Exotic Aquarium Fishes that "There seems to be about as much sense to tapping an aquarium glass to gain the attention of the fishes as there is in speaking in a loud tone of voice to someone who does not understand our language. The result is the same—fear and confusion."

In my short dabbling with the "exotics" I have found that by a light tapping on the glass most of the fish immediately congregate at that point. This is usually when the fish are in the process of dashing from one fish to friends and also when feeding, as they seem to take the food with more vigour. I know other aquarists who can verify my statement.

F. R. W. WHITE, Liverpool, 6.

Having read many accounts of octopuses and fishes learning certain things by experience I decided to try such an experiment myself. Previously to giving any food, either live or prepared foods, I tapped gently on the side. Soon, in about four or five weeks the fish associated tapping with food and now, when I tap, they gather round in the front to await the meal.

L. HIBBERT (aged 12), Ilford, Essex.

The vibration caused by moving covers at feeding time or the sight of the aquarist at the tank side is often sufficient to develop this conditioned reflex behaviour in fishes, and new fishes placed in the tank copy the actions of their tank mates very quickly. Banging or knocking on aquarium glass is not a habit to be encouraged—some nervous species are obviously greatly disturbed by the practice; gentle taps at feeding time most certainly come to be associated with the arrival of food.

Axolotl Breeding

I have read with interest the article on keeping and breeding axolotls in The Aquarist (May). At present I have four black and two white specimens each about ten inches long, which I feed by hand twice a week with meat and occasional worms, etc. They are kept in two 24 in. unplanted tanks having pieces of water-worn rock for them to shelter behind.

This year, from about 500 eggs, I have had eight young. A previous specimen transformed into the salamander stage when about five inches long even though the aquarium held nine inches depth of well aerated water.

W. E. SOMERS, S. Croydon, Surrey.
News from Aquarium Societies

RECENT events arranged by members of the West Bromwich Aquarists’ Society include a show of pupae, a visit to Dudley Zoo and the B.A.F., a display of tropical and freshwater aquaria at a local aquarium exhibition and a visit to the Natural History Museum, Birmingham. Last month a lecture on snails was given by Mr. E. Smart of the Wolverhampton A.S. A field day is planned for next month and a suitable area for collecting aquatic life is being sought.

NEW headquarters of the North Staffs Aquarium Society is at 11-13 Warren Street, Hanley, Stoke-on-Trent. A series of six lectures on fish biology is being given by Dr. R. G. Evans of Keele University at current evening meetings. A party of 40 members visited the B.A.F. in May.

LAST month members of the Watford Aquarists’ Society visited Hastings for this year’s summer meeting. Recent evening meetings have included lectures on bonefish, tropical fishes, habitats, water plants, quizzers and a table show for darners. Riverine species, mountain minnows, mollies, fighters and catfishes.

New Societies

TWENTY-FIVE people attended the inaugural meeting of the Ashton-under-Lyne and District Aquarium Association. Meetings are to be held monthly and interested aquarists in this area should contact the Secretary, Mr. D. C. Cartwright, 43, Carrow Lane, Ashton-under-Lyne, Lancashire.

A SOCIETY to be known as the Brighton Cooperative Aquarium Club has been formed, and the Secretary, Mr. E. Bourke, 48, Firle Road, Hove,Sussex, invites intending members to write to him.

MONTHLY meetings on the first Thursday of each month are to be held by members of the newly-formed Keighley and District Aquarium Society, Secretary of the society is Mr. W. H. R. Green, 66, Queen’s Road, Keighley, Yorkshire.

A MEETING of the North West Lancashire Aquarists’ and Pond-keepers’ Club is to be held on 7th November at the Black Horse Hotel, Lytham St. Annes.

Intending members are requested to write to the Secretary, Mr. P. Paterson, 14, Twelve Acres Crescent, Morecambe, Lancashire.

(Continued overpage)

WILSDEN ANNUAL DINNER

TOP picture: Mayor of Wilmslow (right) presenting a B.A.F. prize card to Mr. R. S. W. M. Draper and to W. G. A. Davies. Centre: Miss G. J. Eaton at the society’s annual dinner.

The Second Annual Dinner of the Wilmslow and District Aquarium Society held on 19th May was well-attended and most enjoyable. In the initial stages of the meal, the Chairman of the society, Mr. W. S. L. Matthews, said in a speech how pleased the Society had been with the choice of Mr. O. R. B. Last, its secretary, for the show secretary of the recent British Aquarists’ Festival and stressed the pride the society felt in its activities during the past year.

July, 1951
Mr. W. G. Bradbrook Chisell (right), chairman of the Bexhill and District Aquarist Society showing the aquarium presented to the Princess Elizabeth Children’s Ward, Bexhill Hospital to Mayor (Alderman) Pycroft (left) after its unveiling by Mr. Charles Taylor, M.P. (centre).

Aquarists living in the area of the Reading Tropical Fish Breeders’ Society are asked to contact the secretary, Mr. E. G. Dalton, 21, Nelson Road, Caversham, Reading, Berks. Meetings of the society are held on alternate Mondays.

Meetings of the newly-formed Sutton and Cheam Aquarists’ Society are to be held at 8 p.m., first and third Tuesdays each month at Sutton Adult School, Benshill Avenue, Sutton. Secretary is Mr. S. Bryant, at the meeting place address.

The Swindon and District Aquarist Society is holding meetings on the first Tuesday of each month at The Angel Hotel, Perton, Wiltshire. Secretary is Mr. R. B. Nokes, 7, Westdown Drive, Upper Stratton, Swindon, Wiltshire.

Aquarists interested in breeding tropical fishes are requested to communicate with Mr. John Andrews, 77, Gillingham Road, Bradford, Yorkshire, who wishes to start a Yorkshire Fish Breeders’ Society. Mr. Andrews also invites suggestions from interested readers.

Secretary Changes

Changes of secretaries have been reported from the following societies: Accrington and District Aquarist Society (Mr. D. Braidley, 12, Warner Street, Accrington); Bournemouth Men’s Institute Aquarists’ Society (Mr. H. A. Cook, 34, Dogiggin Road, Lewisham, S.E.6); Forest Hill and District Aquarist Club (Mr. J. Shearing, 2, Garlies Road, Forest Hill, S.E.23); Kirkcaldy and District Aquarist Society (Mr. F. Harrison, 11, Marshall Street, Kirkcaldy, Fife, Scotland); North of Scotland Aquarist Society (Mr. H. F. Mainie, 114, Bon-Accord Street, Aberdeen); Ryde Aquarist Society (Mr. C. J. Southby, Meadow Cottage, Hayward Avenue, Elmhurst, Ryde, Isle of Wight); South-West London Aquarist Society (Mr. E. G. Weatherley, 42, Niagara Avenue, Northfields, London, W.5).

Crossword Solution

WATERBOATMAN
ARIAU MOAKOE
TETRABROMIO
ETIFEEIN
RIILLABINET
CEILKAM
ALBINOHUTT
RACKYSTER
DITCHES AREA
EDABIA
NERROCTOPUS
SARDINES SPA

Pick your answer (Solution)

1 (c), 2 (c), 3 (b), 4 (d), 5 (a), 6 (d), 6 marks—Top top: 5 marks—Excellent: 4 marks—Very good: 3 marks—Good: 2 marks—Fair: 1 mark—Poor: 0 marks—Low down.

Aquarist’s Calendar

28th July: Federation of British Aquarist Societies General Assembly, 2.30 p.m. at Friends House, Brompton Road, London, N.W.1.

28th July: Romford Aquarist Society Open Day at Larnborough Hall, Western Road, Romford, Essex.

6th August and following: Henley Aquarist Society Festival Open Show. Details: Show secretary, 20, Porchester Avenue, Golders Green, N.W.11.

11th August: Eastbourne and District Aquarist Society Exhibition. Details: Show Secretary, 2, Beach Road, Eastbourne, Sussex.

30th August - 1st September: Bournemouth Aquarists’ Club Exhibition of Pianissima Aquariums at Mr. Peter’s Hall, Bournemouth.

5th-15th September: Nottingham and District Aquarist Society Fifth Annual Show and Exhibition. Details: Show Secretary, 92, Marlborough Road, Beeston, Notts.

6th-8th September: Southampton and District Aquarists’ Society Show at The Avenue Hall, Southampton.

Entries Invited

Bristol Aquarist Society. Open show; schedules from R. V. Cotterill, 9, Marshall Road, Bristol 4. Date: 2nd and 3rd November.

Tottenham and District Aquarist Society’s Annual Open Show. Secretary, Mr. E. F. Russell, 202, Clyde Road, S. Tottenham, N.13. Date: 27th-29th September.

Literature Available

Free pamphlets on the keeping of goldfishes for distribution at public aquaria shows may be obtained from Mr. Owen Deacon, Weeki Down, Winchester, Hants by secretaries of interested societies.

A display of trophies awarded at the British Aquarist Festival in May.
Now on display at the
FESTIVAL OF BRITAIN

“Aquafern”
Acclaimed by both trade and public as the
PREMIER SPAWNING MEDIUM

“Colorfern”
No aquarium is complete without this
amazing fern
IN BEAUTIFUL RED & NATURAL GREEN
A BOON TO ALL AQUARISTS

Refuse imitations and substitutes. The name
“Aquafern” is prominently displayed on every
packet and is your assurance of quality and
safety. Trade enquiries welcomed.

Ask your local dealer today for this new
wonder fern. Decorative. Trouble free.

This is not a synthetic plant

PRICE 1′- AND 2′- PER PACKET
PACKED DRY AND WEIGHTED READY FOR IMMEDIATE USE

AQUAFERN PRODUCTS
COMPANY
113 LEIGH ROAD, LEIGH-ON-SEA, ESSEX
SOLE AGENTS (UNITED KINGDOM)
SET FOR A LONG LIFE OF CONTROL

THE "ELEPHANT"
(Registered Trade Mark)

KEYSET THERMOSTAT
(Prov. Pat. 1595/50)

Combines the ease of adjustment of the Standard Thermostat with the desirable features of an immersion instrument.

Adjustment is made by means of a removable key, and the keyway is then sealed with a moulded rubber plug.

CANNOT BE OPERATED WITH A SCREWDRIVER OR PLIERS

PRICE 25/6

Also "ELEPHANT" STANDARD THERMOSTAT PRICE 25/6. HEATERS, REFRACTORY WOUND, ALL WATTAGES, PRICE 16/3 (incl. P.T.)

FULLY GUARANTEED

ILLUSTRATED LEAFLET ON REQUEST

Evans Electronic Developments LIMITED
EVONIC WORKS, BIRCHFIELD ROAD, BIRMINGHAM, 19
Telephone: NORthern 0792
Garden Aquatics
Aquaria Co.

NYMPHAEAS, SUBMERGED
AND MARGINAL PLANTS,
POND AND AQUARIUM
FISH, WATER AND AIR
PUMPS, BOOKS AND ALL
EQUIPMENT.

47 GREAT GUILDFORD STREET, BOROUGH, LONDON, S.E.1
Near Evelina Hospital and Fire Station, Southwark Bridge Road.
Hours 9.30 to 5.30, Sat. 9.30 to 1 p.m.
Phone: WATerloo 4894

July, 1951
MANCHESTER AQUARIUM Offers—

Large breeding tanks, free of Purchase Tax, carriage at cost. Also frames only, carriage paid. We send anywhere. Prompt attention our speciality. Angle Iron 1 in. rough cast base, 32 oz. glass.

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
<th>FRAMES ONLY</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 x 12 x 12</td>
<td></td>
<td></td>
<td>24 x 12 x 12</td>
<td></td>
</tr>
<tr>
<td>36 x 15 x 15</td>
<td></td>
<td></td>
<td>24 x 15 x 15</td>
<td></td>
</tr>
<tr>
<td>36 x 18 x 18</td>
<td></td>
<td></td>
<td>36 x 12 x 12</td>
<td></td>
</tr>
<tr>
<td>48 x 12 x 12</td>
<td></td>
<td></td>
<td>36 x 15 x 15</td>
<td></td>
</tr>
<tr>
<td>48 x 15 x 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

plus carr. 70–
75–
85–
66.40
67.00
68.00
Carriage paid

Immediate delivery on all plants.

LETTY KREMNER, Aquarium
66 CHEETHAM HILL ROAD, MANCHESTER, 4
5 mins. from Vic. Station
Telephone: BLAackfriars 2163

WHEN PURCHASING YOUR NEXT SUPPLY OF FISH FOOD, INSIST ON . . .

"MERO" WHY?

BECAUSE—"MERO" MEANS MORE MEAT
YOUR FISH EAT BUT LITTLE
—make sure they have the best!

○ SPRATT’S AQUARIUM FISH FOOD
  A properly balanced food for general use, suitable for Goldfish of all varieties up to four inches. In 3d. and 1/- packets, 3½-lb. bags 5/-, 7-lb. bags 9/10. For larger fishes, feed Spratt’s Pond Fish Food.

○ SPRATT’S TROPICAL FISH FOOD
  In two grades, fine and coarse, contains Dried Liver-Meal, Yeast, Dried Shrimp, etc. In 1/- Drums.

○ SPRATT’S AQUARIUM COMPOST

○ SPRATT’S “RECTO”
  A scientifically prepared mineral, most beneficial to the fish, cures fungus, etc. In 1/4 packets

SPRATT’S FISH FOODS AND AIDS
SPRATT’S PATENT LTD., 41-47 BOW ROAD, LONDON, E.3

ARBOLOTE Q.S.
Aquarium Glazing Compound

Available in the following shades: Grey, Cream, Red, Green and Blue. Packed in 1½-lb., 2½-lb., 4-lb., 7-lb. and 14-lb. tins; also in ½-cwt., ¼-cwt. and 1-cwt. kegs.

ADSHEAD RATCLIFFE & CO LTD
ADSHEAD, RATCLIFFE & CO LTD BELPER DERBY
Tel. BEL 351-2

July, 1951
Old Clients won't let me build up a stock this year!

HAVE THE FOLLOWING PLANTS ONLY FOR DISPOSAL

Ambulia 8/- doz., Hygrophiila 8/- doz., Red Georgian Myrio 15/- doz.,
Florida Myrio 5/6 doz., Proserpinacoides, surface growing phase, 4/- doz.,
Elodea Grandiflora 2/6 doz., Bacopa plants 10/- doz., cuttings 4/6 doz.
Salvinia 1/- per portion. Garden Pools 2/-, post paid from here, is a sound
guide for the pond builder and keeper, and Derham's Luck is a change from the
usual "Fishy" literature. The latter is 2/6 from here, post paid.

Dealers please note.—Despite rumours (why, I wonder?) that the unique Fish
Food, Elite, is in short supply, it is not difficult to get. It is in ample supply,
and prompt delivery, from Barry M. Austin, 230, Staines Road, Twickenham

BUSINESS BY POST ONLY S.A.E. FOR ENQUIRIES

Arthur Derham, 23 Queen's Avenue, Watford, Herts.
Telephone: WATFORD 2708

---

TROPICAL AND COLDWATER AQUARIAS
THE LITTLE SHOP WITH THE LARGE STOCK OF TROPICALS, TANKS, STANDS AND APPLIANCES

SPECIAL OFFER

Steel frame glazed aquariums, 24 x 12 x 12, 38/-, 24 x 15 x 12, 42/- and 47/-, 18 x 10 x 10, 30/-. AQUA
AQUARIUM HEATERS 10/- each, by post 11/-, MONTROSE THERMOSTATS 13/6 and 19/6, by post
1/ extra. All leading makes of air pumps, thermostats, heaters, etc., in stock. Aquariums sent at owners' risk, carriage at cost. Aquarium plants in good variety.

RARE TROPICALS

Angel Fish ... each 7/6, 5/- Harlequins ... each 9/6
Cherry Barb ... each 6/- Beacons ... 4/-
Niger ... each 5/- Moenkhausia Petteri ... 5/-
Tiger ... each 4/- Pulchers ... 8/-
Ticto ... each 4/- Pristella Riddeli ... 4/-
Dwarf Gouramis (large) pair 15/- Lemon Tetas ... 9/-
Glowlights ... each 9/6 Penguin Fish ... 8/-
Hyp. Rosaceus ... 9/- Black Widows ... 4/-
Serpa ... 9/- Barbus Schubertii ... 7/-
Flames ... 3/- Nannostomus Anomalus ... 9/-
Neons ... 10/- White Cloud Mountain Minnows ... 4/-
Copper Tetras ... 4/6 Ambassis Lala ... 8/-

50 Varieties of tropicals to choose from. Live foods all the year round

WE ARE WHOLESALE IMPORTERS OF TROPICALS. TRADERS, PLEASE APPLY FOR LIST

The New "Prockter" Thermostat now in stock, 36/-, by post 1/- extra

THE BIRD SHOP & AQUARIAS, 3 The Avenue, West Ealing, London, W.13
Half a minute West Ealing station. Hours: 9.30 a.m.—6.30 p.m. Telephone: PERivale 0777

---

THE AQUARIST
WALTER R. SMITH
For Complete Tropical and Coldwater Aquaria
39 TIB STREET, MANCHESTER, 4

We specialise in Angle Iron aquariums and frames, also stands. Nine standard sizes always in stock, despatched in crates chargeable at 30/- (returnable) half carriage paid, any odd size made to order and painted any colour, guaranteed square and free from welds, satisfaction or money refunded.

FIFTY VARIETIES OF TROPICAL AND COLDWATER FISH USUALLY IN STOCK. FORTY-FIVE LARGE TANKS OF FISH ON VIEW


PRICE LISTS FREE ON APPLICATION

SOUTH WESTERN AQUARISTS
2 GLENBURNIE RD., TRINITY RD., UPPER TOOTING, S.W.17

Telephone: BALHAM 7334

We introduced the "CONSTAT"
We now introduce the "GLEN"
Superb Filter

AN ENTIRELY NEW TYPE OF FILTRATION.
COMBINES MINIMUM AIR CONSUMPTION
WITH MAXIMUM LIFT

Price 91/-
KINGSLAND FISHERIES
AVONMORE PLACE, LONDON, W.14
(50 yards down Avonmore Road OPPOSITE FRONT OF OLYMPIA)
HOURS OF BUSINESS: Mon. to Sat. 10 a.m.–6 p.m.  Closed all day Thursday
GOOD VARIETY OF POPULAR SPECIES OF
HEALTHY TROPICAL FISH AND PLANTS
OVER THIRTY SPECIES ARE BRED ON
OUR OWN PREMISES
ALSO FULL RANGE OF TANKS AND EQUIPMENT
PERSONAL CALLERS ONLY  LIVE FOOD ALWAYS IN STOCK
VERY COMPETITIVE PRICES

TROPICAL FISHKEEPERS
We offer
PLANT BULBS
(Aponogeton Undulatum)
(Aponogeton Ulvaceus)
3/6 EACH C.W.O.
TRADE SUPPLIED
GRAVESEND & MEDWAY AQUARIAS
10 PRINCES STREET, GRAVESEND,
KENT

"RELIABLE" THERMOSTATS
BUY THE BEST
It's cheaper in the end
Ask for a
"RELIABLE"
THERMOSTAT
and enjoy
RELIABLE
SERVICE
Price 29/6
Robust Bi-metal strip, finest large contact points, positive screw action, the whole mounted on strong plastic base.
(Wholesale only)
"That is the best and SAFEST Thermostat we have seen so far" were the words of a Factory Inspector (one of two who visit our Works from time to time) after examining a batch we were making.

"A PRODUCT OF LIGGINS"
167 WICKERSLEY ROAD, ROTHERHAM
TOM NORTH
AQUARIST——ORNITHOLOGIST
GRAND SELECTION OF TROPICALS FOR PERSONAL SHOPPERS ONLY
NEON TETRAS FROM 8/6 EACH
I am open to buy good quality Tropicals for resale

Wanted also a weekly supplier of
Live Daphnia

AQUARIUMS — FISH FOODS — APPLIANCES
Breeder of high class pedigree Budgerigars
Call and see my stock or S.A.E. for List

217 ILFORD LANE, ILFORD, ESSEX

MADE YOUR OWN AQUARIUM

At BELLE VUE!
The Black Magic Stand at Belle Vue May Festival was an outstanding success.
The primary object—to make personal contacts with users and traders from all parts of the country, to answer queries, to give advice and glaze demonstrations on the use of the Wonder Sealing Compound of the Century—fully justified the venture; and we are encouraged to believe that we have emerged from our first public appearance with flying colours!

There were always interested spectators on hand to watch the glazing demonstrations, showing how delightfully simple it really is to make one's own aquarium with Black Magic, The Leakproof Aquarium Cement—The quick, modern method!

The glass-cutting lessons were always popular and every information (and so-called trade secrets) was freely and gladly imparted.

A happy handshake from the Manchester aquarist, the originator of the well-known phrase—"The glass will not leak"—gave us much delight. The potty was that the famous Stone county expert, specialist and exhibitor who christened our stand was present too to complete our pleasure.

Exhibits on view were:—the 24 x 12 x 3 old, pot-bellied tank, hopefully leaking all round and with great cracks in one end reaching from bottom to top, but made serviceable from inside with narrow glass strips (and Black Magic—of course). The 24 x 12 x 15 deep aquarium, constructed of half-inch glass with three-quarter inch bottom. Try making this with pot-belly?—the notice reads! The 7 x 6 x 6 and 10 x 8 x 6 Mini-Tanks, made of 3 metal pieces—no welding, no soldering, no riveting. The Breeding Trap for Livebearers, and the Hatchery Corridor for Angel Eggs.

BLACK MAGIC "NEVVARUST" AQUARIUM
This 16 x 12 x 3 exhibit caused great and genuine interest. Every aquarist is (unfortunately) acquainted with the rust-bug which top membrane of frame and, we showed how easy it is to defeat it—with Black Magic, of course! (This was intended as an exhibit only but was eagerly purchased for several reasons.)

What made this one of the outstanding exhibits was the fact that the four tanks were exhibited at 10.6, and many buyers, did not have the 14 x 8 x 8 set at 14.4., and saw

SPECIAL ANNOUNCEMENT
K.T. AQUARIA
Have pleasure in announcing the opening of new business premises at
16a HIGHGATE RD., N.W.5
One minute from Kentish Town tube station (opposite the Forum Cinema).
Bus services 27, 27A, 134 and 137.
Trolleybus services 513 and 613. All aquarists will be extended a warm welcome.

July, 1951

BLACK MAGIC LEAKPROOF AQUARIUM CEMENT
16 x 10 x 9 set at 17.6 (carriage extra in all cases).
Looking back, we enjoyed every minute of the Belle Vue adventure, and if we possessed anything like a chest we should be strutting about like a peacock sticking out our tails proudly! Our apology for this very indespensable portion of the human form! To the many thousands who passed through Belle Vue on this momentous occasion, we say, "Thank you" for your genuine and kindly attention and interest and happy company.

THE SENSATION AT BELLE VUE!
Without doubt the wonderful tubular aquarium staged by Ulster Aquatics of Belfast, caused quite unusual interest, and small wonder, for these were really beautiful in every way. Pictures featured in ads, giving no idea of their beauty and elegance, they must be really seen to be fully appreciated. Everything of the best goes into these ultra-modern productions. Our interest of course lies in the fact that Black Magic is used in the sealing media by these connoisseurs, and if evidence is needed of the superiority of the wonder compound of the century, then here it is! Master, Ulster Aquatics did not plunge for ordinary glazer's putty—which can be made into any attractive color with little or no trouble—they sought the best!

Make your own aquarium—if it's easy, with Black Magic—of course! But if you don't feel like it, then insist upon your purchased aquarium being sealed with it—and feel safe! Ask at your dealer's or pet stores for Black Magic! If he hasn't got it, he can jolly soon get it for you if he has your interests in mind. In any case the proprietor will gladly supply you with a guarantee by return post at that! See about it now, and don't feel frustrated if unattainable locally.

This is what a Plymouth aquarist wrote (25.5.51) "I would not like to attempt to glaze a tank with any other un-named leakproof (1) concoction, having proved the worth of your product over the past years." Remember you run no risk with Black Magic; it is a wonderful record—it is not here to-day and gone to-morrow, a nine days' wonder.

Easy—the Black Magic Way!
To Subscribers of the

"Encyclopedia of Water Life"

It is with much regret, that owing to the very difficult World paper situation the publication of Vol. 2 has been delayed.

However I have every hope that suitable paper will become available in the near future, and in response to numerous requests, Vol. 2 will deal mainly with tropical fish and the more technical items included in the later volumes.

J. J. Hoedeman—Editor
Amsterdam, Holland

---

HILLWARDS

OF BIRMINGHAM

Tropical Fish Breeders and Importers. Wholesale Suppliers

RETAILERS, SEND FOR LIST

COMPETITIVE PRICES

ONLY GENUINE RETAILERS SUPPLIED

Fifty varieties usually in stock

Guaranteed live delivery and free from disease

343 COVENTRY RD., SMALL HEATH, 10

---

PREPAID ADVERTISEMENTS

4d. per word (12 words minimum) Box No. 6d. extra

---

FOR SALE

AQUARIUMS, tropical fish, and accessories. Plants, tubifexes, Bathyfry's—Aquarium—Warner Street, Accrington (two minutes off Phone 2294).

WESTMORLAND, Mendip and other stone, suitable for p-aquariums, wading, paving. London stock to suit all requirements. Large and small pieces. Descriptive price lists on application. Parrs, Garden Stone Merchants, 455, Old Ford Road, London, (ADVERTISE 2991).

EVERYTHING in rubber. Hose, suction of all types, bellows. Price list on request. Trade only supplied. P.S. Brass, 56, E. wood Road, London, S.W.12.

AQUARIUMS, fish, plants, steamers, heaters, aerators, p-pumps, appliances, live daphnia, tubifex, micro, always in stock. Campbell Aquaria, Breeders of Birds, Peis and Fancy Fish, Cambridge Highway, Kingston, Surrey. (Callers only).

EASY terms, heaters, steamers, aerators, pumps, aquariums at reasonable prices. Straightforward easy terms arranged, send stamp for full particulars. Joseph Stanley Ltd., Aquatic Experts, 17, 5 brook Street, Birmingham, 2.

AQUARIUM, America's leading monthly aquarist's magazine, edited by W. E. Boys. One year's subscription 21/6. Also available: 57/6; National Geographic, 43/; Popular Science, 28/6, etc. For full list, write: Mason 75, Southbrook Road, Exeter.


ANGLE from Aquaria, 32 in. and 1 quirk. 20s., 40s.; 24 × 12 × 12: 15 × 12 30s.; 36 × 15 12 60s. Pressed steel aquaria, 12 × 9 × 9 10s.; 18 × 9 × 9 16s.; Two tier stands 24 × 12 35s. Tropical plants, food, accessories. Syd Sharrock, 128, Park Street (E. Chester), Derby.

GOLDFISH, shubunkins, gold orfe, carps, tench, pike, bream, brown trout. Trout Fisheries, Gr. Stambridge, Nr. Rochford, Essex.

WHITE WORM and Microworm guaranteed cultures with instructions. 195. 55, Lower Road, Epsom, Surrey.


DAPHNIA 10s. including postage, c.w.o. Supply own case. All enquiries invited. Box 3071, The Aquarium, The Butts, Half Acre, Brentwood, Middx.

VALLISNERIA Spiralis 3s.-per dozen. E. P. Crisp, Prop. 2½s., 4s. per dozen. Hornwort and Willow moss 9d. per bunch. Postage and packing 6d. Large black Ramshorn Snails 3s.—per dozen. Young Fanail snail 5s.—per 1 dozen, 40s.—per dozen. C.W.O. to J. W. McGrath, 12, High Street, Sidle, Blackley, Manchester, 9.

WHITE WORMS (Encytra). A safe food your fish will thrive. 2s. and 3½ portions, post free. Reg. Hobbie, 64, Yarnsdale Road, Birmingh, 14.

WAGTAIL Swords, Reds, Greens, Waggel Platies, Reds, Yellows, Albino Swords, Goldenhead Guipone, Perinas, Mollies, etc. At Beacon, Barby, Chester, Chelsea, Sheffield, Glasgow, Flames, etc. Wyzows, Zebras, Pearls, etc. Plants, Accessories. Callers only view and week-end. Stanley Hacker, 45, Ashburnham Grove, Nr. Uxwich Station.

SEEDING Sparramocarpus. Ideal for Aquaria, 3½ each. M. A. P. 563a, West St., Crewe.


TROPICAL Fish, Large selection always available. Goldfish, biscuits, etc. Aquarius, Heaters, etc. Tubifex, Micro Grindal Worms. British Livestock, Lowther Street, Coventry.

WANTED

WHITE Goldfish, Fighters (Veilis), Pearls, Dwarfs, Wags, etc. Quick or single. Plants, reasonable. Evening or weekends. Hayma Harbourside Rd., Forest Hill, S.E.23.


WANTED. Surplus Fish, all varieties. Aquaria Frames, etc. British Livestock, Lowther Street, Coventry.

---

THE AQUARIUM